

Removal of Dissolved Pollutants from Urban Stormwater Runoff

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Stormwater runoff, because of its heavy metals and poly aromatic hydrocarbons (PAHs) content, may be considered toxic for discharge to receiving surface waters without further treatment. A number of structural devices, collectively known as structural best management practices (BMPs), are employed to treat these contaminated runoffs. A majority of these structural BMPs rely exclusively on physical separation processes, such as sedimentation. Although these devices (e.g., wet ponds) remove suspended and associated pollutants to a large extent, sufficient quantities of soluble pollutants are not removed in amounts that meet discharge criteria.

To address this problem, various naturally occurring low-cost materials, such as pine bark, rice husk, tree fern, and compost, have been used to remove these dissolved pollutants. However, studies to evaluate the performance of natural organic filter media have been limited to either organic or heavy metals and not to a mixture of both pollutant species.

This poster will present the results of a study to evaluate the performance of hardwood mulch in removing selected pollutants (i.e., heavy metals: copper, chromium, cadmium, lead, zinc; and toxic organics: naphthalene, fluoranthene, 1,3-dichlorobenzene, benzo[a]pyrene, and benzylbutyl phthalate) from their mixture. Quantitative information was collected on (a) percentage removal, (b) stability of the sorbed pollutant to washing, (c) sorption capacity of the mulch for each pollutant, and (d) rate of sorption.